

5 **What is claimed is:**

1. A communications system for use with an implantable medical device,
comprising:

10 a pulse generation circuit to deliver a first electrical signal at a first threshold
to electrically stimulate body tissue;

 a control circuit coupled to the pulse generation circuit, the control circuit to
cause the pulse generation circuit to deliver a second signal at a second threshold
below the first threshold to prevent substantial physiological effects in response to the
second signal, the second signal including encoded data; and

15 a receiving circuit to receive the second signal, enabling external transfer of
the encoded data.

2. The system of Claim 1, wherein the second signal is a modulated biphasic
pulse.

20

3. The system of Claim 2, wherein the biphasic pulses are delivered during a
refractory period.

4. The system of Claim 2, wherein the second signal is an amplitude modulated
biphasic pulse.

25

5. The system of Claim 2, wherein the second signal is a frequency modulated
biphasic pulse.

6. The system of Claim 2, wherein the second signal is a pulse-width modulated
biphasic pulse.

30

7. The system of Claim 6, wherein the pulse generation circuit includes a circuit
to perform pulse train modulation on the second signal.

35

- 5 8. The system of Claim 6, wherein the pulse generation circuit includes a circuit to control the polarity of the biphasic pulse.
9. The system of Claim 1, further comprising a trigger circuit coupled to the control circuit to receive a trigger signal from outside the body, the control circuit
10 causing the pulse generation circuit to deliver the second signal in response to the trigger signal.
10. A method of providing communication between an implantable medical device and an external device, comprising the steps of:
- 15 generating a first electrical signal at a first threshold to electrically stimulate body tissue;
 generating a second electrical signal, including encoded data, at a second threshold below the first threshold to prevent physiological effects in response to the second signal; and
20 sensing the generation of second signal at the external device.
11. The method of Claim 10, wherein the second signal corresponds to multiple biphasic pulses.
- 25 12. The method of Claim 11, wherein the second signal corresponds to modulated biphasic pulses.
13. The method of Claim 11, wherein the second signal is delivered at a predetermined time relative to a cardiac cycle of the heart.
30
14. The method of Claim 10, further comprising the step of providing an external signal from outside the body to trigger delivery of the second signal.
15. The method of Claim 10, wherein the second signal includes marker channel
35 data.

5 16. The method of Claim 10, wherein the second signal corresponds to patient data.

 17. The method of Claim 10, wherein the second signal corresponds to device-specific data.

10

 18. The communications system of claim 10, wherein the second electrical pulses are transmitted during segments of time related to one of a sensed cardiac event and a pacing pulse.

15

 19. The system of claim 10, wherein the second signal is transmitted during segments of time related to one of a sensed cardiac event and a pacing pulse.

 20. The method of claim 10, wherein the second electrical signal is generated during segments of time related to one of a sensed cardiac event and a pacing pulse.

20